

REMARKS

Claims 1-15 are now pending in this application. Claims 1-3 and 5-10 are independent. Claims 10-15 have been added, claims 3, 7, and 8 have been amended, and no claims have been canceled by this amendment.

Amendment to the Specification

The present Specification has been amended to correct obvious errors in the application, as published. No new matter is involved by any amendment to the Specification.

Drawing Objection

Withdrawal of the objection to Drawing FIG. 1 is requested. Responsive to the stated basis for objection, FIG. 1 has been amended to include the legend “Conventional Art”.

Claim Objection

Withdrawal of the objection to claim 3 is requested. Claim 3 has been amended in a manner which is believed to remove the stated basis for objection.

Anticipation Rejection over Chatterjee et al.

Withdrawal of the rejection of claim 1 under 35 U.S.C. §102(b) as being anticipated by Chatterjee et al. (US 5,898,340) is requested.

Applicant notes that anticipation requires the disclosure, in a prior art reference, of each and every limitation as set forth in the claims.¹ There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. §102.² To properly anticipate a claim, the reference must teach every element of the claim.³ “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or

¹ *Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir. 1985).

² *Scripps Clinic and Research Foundation v. Genentech, Inc.*, 18 USPQ2d 1001 (Fed. Cir. 1991).

inherently described, in a single prior art reference”.⁴ “The identical invention must be shown in as complete detail as is contained in the ...claim.”⁵ In determining anticipation, no claim limitation may be ignored.⁶

In particular, the applied art does not disclose an audio reproducing apparatus for amplifying an audio signal according to a pulse width modulation signal generated based on a digital audio signal which includes, among other features, “...a second control loop for *feeding forward the pulse width modulation signal to the supply control portion of the power source* for amplification to compensate the pulse width of the control signal,” as recited in independent claim 1.

The applied art is completely silent on any disclosure of feed-forward compensation techniques as recited in claim 1. Instead, Chatterjee et al. merely describe conventional feed back techniques, particularly in the portion cited by and relied upon by the Examiner as disclosing the “second control loop” limitation above, i.e., Chatterjee et al. at col. 5, lines 40-50 and FIG. 1, units 108 and 211-213.

Since the applied art does not disclose each limitation, withdrawal of the rejection and allowance of claim 1 are respectfully requested.

Anticipation Rejections over Carver

Withdrawal of the rejection of claims 2-4 and 7-9 under 35 U.S.C. §102(e) as being anticipated by Carver (US 6,104,248) is requested. The legal requirements for anticipation have been set forth above.

³ See MPEP § 2131.

⁴ *Verdegaal Bros. v. Union Oil Co. of Calif.*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

⁵ *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

⁶ *Pac-Tex, Inc. v. Amerace Corp.*, 14 USPQ2d 187 (Fed. Cir. 1990).

Independent Claim 2

The applied art does not disclose an audio reproducing apparatus for amplifying an audio signal according to a pulse width modulation signal generated based on a digital audio signal which includes, among other features, "...a first control loop for feeding back ***a source voltage*** supplied to amplification means for amplifying the audio signal to a supply control portion of a power source for amplification..." as recited in independent claim 2.

Carver is completely silent on any disclosure of feeding back the source voltage supplied to the amplification means in the manner recited in claim 2. Instead, Carver merely describes conventional analog feed back techniques involving only the analog output signal, particularly in the portion of the reference cited by and relied upon by the Examiner.

For example, resistors R1 and R2 in input reference amplifier 220 depicted in FIG. 5 of Carver and referenced by the Examiner are selected merely to establish the gain of amplifier OP1 by providing feedback from the output of inductive power converter 226 to the inverting input terminal of amplifier OP1. Further, in audio amplifier circuitry 240, resistors R5 and R6 are provided as conventional feedback resistors to control the analog gain of audio amplifier AA1 by feeding back the analog output 240A to the inverting input of amplifier AA1 (see col. 7, line 60 through col. 8, line 2), for example.

To reiterate, Carver is entirely silent on providing any teaching of feeding back the ***source voltage supplied to the amplifier*** (amplification means) to a supply control portion of a power source for amplification as recited in claim 2.

Since the applied art does not disclose all of the claim limitations, withdrawal of the rejection and allowance of claim 2 are therefore respectfully requested.

Independent Claim 3

The applied art does not disclose an audio reproducing apparatus which includes, among other features, "modulation means for performing a conversion process based on modulation of an inputted digital audio signal and generating a pulse width modulation signal...and

compensation means for feeding back a source voltage supplied to the amplification means...so as to compensate the predetermined control signal,” as recited in independent claim 3, as amended.

The audio signal in Carver is an *analog signal*, and not a digital audio signal, as claimed. In addition, as stated above, Carver is completely silent on any disclosure of feeding back the *source voltage* supplied to the amplification means as recited in claim 3. Instead, Carver merely describes conventional feed back techniques involving only the analog output signal, particularly in the portion cited by and relied upon by the Examiner, as discussed above.

Dependent claim 4 depends on allowable independent claim 3, and is submitted as being allowable at least on that basis, without further recourse to the additional patentable limitations contained therein, e.g., the clause “wherein the compensation means compensates the pulse width of the predetermined control signal based on the feedback-inputted *and feedforward-inputted* signals.

Since the applied art does not disclose all of the claim limitations, withdrawal of the rejection and allowance of claims 3 and 4 are therefore respectfully requested.

Independent Claim 7

The applied art does not disclose an audio reproducing apparatus for amplifying an audio signal according to a pulse width modulation signal generated based on a digital audio signal which includes, among other features, “means for detecting *a source voltage* supplied to amplification means *for amplifying the digital audio signal...*,” as recited in independent claim 7, as amended.

Carver does not amplify a digital audio signal; the audio signal in Carver is analog. Further, Carver is completely silent on any disclosure of a means for detecting a source voltage supplied to the amplification means, as recited in claim 7.

Since the applied art does not disclose all of the claim limitations, withdrawal of the rejection and allowance of claim 7 are therefore respectfully requested.

Independent Claim 8

The applied art does not disclose an audio reproducing apparatus for amplifying an audio signal according to a pulse width modulation signal generated based on a digital audio signal which includes, among other features, “generating means for generating a signal of approximately a same amplitude as a variation of ***a source voltage*** supplied to amplification means and of an opposite phase based on the pulse width modulation signal; and feedforward means for feeding the signal forward to a supply control portion of the power source for amplification so as to compensate a pulse width of a control signal for controlling supply of the power source for amplification based on the signal fed forward,” as recited in independent claim 8, as amended.

As discussed above, Carver is completely silent on any disclosure of using the source voltage supplied to the amplification means to compensate the audio reproducing apparatus, as recited in claim 8. Instead, Carver merely feeds back the analog signal.

Since the applied art does not disclose all of the claim limitations, withdrawal of the rejection and allowance of claim 8 are therefore respectfully requested.

Independent Claim 9

The applied art does not disclose an audio reproducing apparatus for amplifying an audio signal according to a pulse width modulation signal generated based on a digital audio signal which includes, among other features, “feeding back a signal of an amplitude according to ***a source voltage*** supplied to amplification means...generating a signal of approximately a same amplitude as a variation of ***the source voltage*** supplied to the amplification means and of an opposite phase based on the pulse width modulation signal; feeding the generated signal forward to the supply control portion of the power source...,” as recited in independent claim 9.

As discussed above, Carver is completely silent on any disclosure of using the source voltage supplied to the amplification means in the manner recited in claim 9, but instead merely feeds back the analog signal.

Since the applied art does not disclose each claimed limitation, withdrawal of the rejection and allowance of claim 9 are respectfully requested.

Unpatentability Rejection over Carver and Kohdaka et al.

Withdrawal of the rejection of claims 5 and 6 under 35 U.S.C. §103(a) as being unpatentable over Carver in view of Kohdaka et al. (US 5,245,345) is requested.

At the outset, Applicant notes that, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations.⁷ Further, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.⁸

Independent Claim 5

The applied art, either alone or in combination, does not teach or suggest an audio reproducing apparatus which includes, among other features, "...signal generation means for generating a signal of approximately the same amplitude as the variation of ***a source voltage*** supplied to the amplification means and of the opposite phase based on the pulse width modulation signal generated by the $\Delta\Sigma$ modulation means...and second comparison means for inputting to one input terminal the triangular wave signal generated by the triangular wave generation means and inputting, to the other input terminal, the difference signal outputted from

⁷ See MPEP §2143.

⁸ *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) and See MPEP §2143.

the first comparison means so as to compare the two input signals, generate the predetermined control signal, and supply the predetermined control signal to the power source supply control means,” as recited in independent claim 5.

While Kohdaka et al. may disclose use of delta-sigma modulation techniques for a digital-to-analog converter, Kohdaka et al. does not make up for the previously identified deficiencies of Carver, discussed above with respect to independent claims 2, 3 and 7-9. In particular, neither Carver nor Kohdaka concern themselves with using or monitoring the *source voltage* supplied to the amplification means to control the audio reproducing apparatus, as disclosed and claimed by Applicant.

Further, the Examiner broadly and incorrectly characterizes Carver FIG. 5, units 210 (steering network), 210A (positive signal), 210B (negative signal), 220 (input reference amplifier), 222 (pulse-width modulator), 224 (driver), 226 (inductive power converter), 226A (output of inductive power converter 226), 230 (input reference amplifier), 232 (pulse-width modulator), 234 (driver), 236 (inductive power converter), and 236A (output of inductive power converter 236) as teaching the recited “signal generation means.” Applicants respectfully traverse this mischaracterization.

Carver at least does not teach or suggest generating a signal “based on the pulse width modulation signal generated by the $\Delta\Sigma$ modulation means,” even if combined with Kohdaka et al., as suggested by the Examiner.

Applicants also traverse the Examiner’s assertion that the clock generator 212 in Carver is equivalent to the recited “triangular wave generation means.” There is no teaching or suggestion that Carver’s clock is a triangular wave, nor is there a teaching or suggestion that such a clock is recognized as being an art equivalent to a triangular wave generator.

A Prima Facie Case of Unpatentability has not Been Made

Not only does the suggested combination fail to teach or suggest all the claimed limitations, the motivation to combine Carver with Kohdaka et al. is facially deficient.

An essential evidentiary component of an obviousness rejection is a teaching or suggestion or motivation to combine the prior art references.⁹ Combining prior art references without evidence of a suggestion, teaching or motivation simply takes the inventors' disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight.¹⁰

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.”¹¹ Further with regard to the level of skill of practitioners in the art, there is nothing in the statutes or the case law which makes “that which is within the capabilities of one skilled in the art” synonymous with obviousness.¹² The level of skill in the art cannot be relied upon to provide the suggestion to combine references.¹³

Applicants submit that a person of ordinary skill in the art would not have been motivated to combine the teachings of Carver, directed to *analog* signal amplification using a tracking power supply with Kohdaka et al., in which delta-sigma modulation techniques are used to reduce clock noise and improve the resulting signal-to-noise ratio, among other features.

Applicants also take issue with the Examiner's statement of the motivation to combine Carver with Kohdaka et al., i.e., that “[i]t would have been obvious for one of ordinary skill in the art to combine the teachings of Carver and Kohdaka for the purpose of higher fidelity in a class D amplifier with a digital input.”

A “class D” amplifier is not claimed in any pending claim. Further, the Examiner appears to improperly rely upon various assertions of inherency in rejecting the claims as being unpatentable over the suggested combination.

Included in the various arguments of inherency is the statement in which the Examiner indicates that “Carver does not teach a class D amplifier for use with the tracking power

⁹ *C.R. Bard, Inc. v. M3 Systems, Inc.*, 48 USPQ2d 1225 (Fed. Cir. 1998)

¹⁰ *Interconnect Planning Corp. v. Feil*, 227 USPQ 543 (Fed. Cir. 1985)

¹¹ See MPEP §2143.01, citing *In re Rouffet*, 149 F.3d, 1350, 1357, 47 USPQ2d 1453, 1457-8 (Fed. Cir. 1998).

¹² *Ex parte Gerlach and Woerner*, 212 USPQ 471 (PTO Bd. App. 1980).

¹³ See MPEP §2143.01, citing *Al-Site Corp. v. VSI Int'l Inc.*, 50 USPQ2d 1161 (Fed. Cir. 1999).

supply...[h]owever, it is inherent that the PWM used in the tracking power supply could have been used to create a class D amplifier, as shown in the prior art (Fig. 2).”

Whether or not the prior art to Carver in FIG. 2 discloses a class D amplifier, applicants traverse the assertion of any inherency that PWM of a $\Delta\Sigma$ modulation applied an inputted digital audio signal would be obvious, in light of the various claim limitations setting forth the feedback and feedforward aspects of the claimed invention, in particular, using the source voltage supplied to the amplification means to control the audio reproducing apparatus.

If the Examiner insists on continuing to assert “inherency” of any claim limitation, Applicants respectfully request that a reference showing any asserted inherent features be provided with the next Official Action.

Independent Claim 6

The applied art, either alone or in combination, does not teach or suggest an audio reproducing apparatus which includes, among other features, “...triangular wave generation means for generating a triangular wave signal based on a predetermined clock signal; signal generation means for generating the signal of approximately the same amplitude as the variation of a source voltage supplied to the amplification means and of the opposite phase based on the pulse width modulation signal generated by the $\Delta\Sigma$ modulation means...second comparison means for inputting to one input terminal the triangular wave signal generated by the triangular wave generation means and inputting to the other input terminal the difference signal outputted from the first comparison means so as to compare the two input signals and generate the predetermined control signal and supply the predetermined control signal to the power source supply control means,” as recited in independent claim 6.

The arguments stated above with regards to independent claim 5 are incorporated herein in the interests of brevity. The applied art does not teach or suggest all the claimed limitations, and the stated basis for motivation to combine the references in the manner suggested by the Examiner is deficient, as discussed above.

Since the applied art does not teach or suggest all the claim limitations, withdrawal of the rejection and allowance of claims 5 and 6 are requested.

New Claims

New claims 10-15 have been drafted to avoid the applied art, and to define Applicant's invention using alternative claim language directed to a digital power amplifier. Consideration and allowance of these claims is requested. No new matter is involved with any new claim.

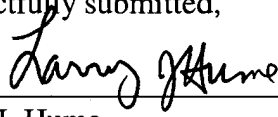
Conclusion

In view of the above amendment, applicant believes that each of pending claims 1-15 in this application is in immediate condition for allowance.

If the Examiner believes that an interview would serve to resolve any remaining issues, the undersigned attorney is available at the telephone number indicated below.

For any fees that are due, including fees for excess independent claims, please charge CBLH Deposit Account No. 22-0185, under Order No. 22040-00017-US from which the undersigned is authorized to draw.

Respectfully submitted,

By 
Larry J. Hume

Registration No.: 44,163
CONNOLLY BOVE LODGE & HUTZ LLP
1990 M Street, N.W., Suite 800
Washington, DC 20036-3425
(202) 331-7111
(202) 293-6229 (Fax)
Attorney for Applicant

Attachment: Replacement Drawing Sheet (FIG. 1)

AMENDMENTS TO THE DRAWINGS

The attached Replacement Drawing Sheet includes changes to FIG. 1 to include the legend “Conventional Art”, as required by the Examiner.

No new matter is involved with this drawing amendment or Replacement Drawing Sheet.

Entry of the Replacement Drawing Sheet is requested.

Attachment: Replacement sheet, FIG. 1